CLAIMS

What is claimed is:

1. A method for automatically partitioning a behavioral description of an electronic system between hardware and software for optimizing the system, comprising the steps of:

(a) receiving a behavioral description of the electronic system;

(b) determining an optimal functionality between hardware and software of the electronic system; and

(c) partitioning implementation of the functionality between the hardware and software based on the determined optimal functionality.

2. A method as recited in claim 1, wherein the step of partitioning implementation of the functionality includes varying at least one parameter of at least one of the hardware and software.

3. A method as recited in claim 1, wherein the hardware and software are formed on a reconfigurable logic device.

4. A method as recited in claim 1, further comprising the step of outputting at least one of a description of the required processors, a description of the machine code to operate the processors, and an identification of the necessary hardware.

5. A method as recited in claim 1, wherein the step of determining an optimal functionality includes generating a plurality of different partitions of the functionality, estimating a performance of the hardware and software for each of the different partitions, and selecting one of the different partitions based on the estimate.

6. A method as recited in claim 1, further comprising utilizing a genetic algorithm for estimating the performance of the hardware and software for each of the different partitions.

7. A computer program embodied on a computer readable medium for automatically partitioning a behavioral description of an electronic system between hardware and software for optimizing the system, comprising:

(a) a code segment that receives a behavioral description of the electronic system;

(b) a code segment that determines an optimal functionality between hardware and software of the electronic system; and

(c) a code segment that partitions implementation of the functionality between the hardware and software based on the determined optimal functionality.

8. A computer program as recited in claim 7, wherein the code segment that partitions implementation of the functionality includes a code segment that varies at least one parameter of at least one of the hardware and software.

9. A computer program as recited in claim 7, wherein the hardware and software are formed on a reconfigurable logic device.

10. A computer program as recited in claim 7, further comprising a code segment that outputs at least one of a description of required processors, a description of machine code to operate the processors, and an identification of necessary hardware.

11. A computer program as recited in claim 7, wherein the code segment that determines an optimal functionality includes a code segment that generates a plurality of different partitions of the functionality, a code segment that estimates a performance of the hardware and software for each of the

different partitions, and a code segment that selects one of the different partitions based on the estimate.

12. A computer program as recited in claim 7, further comprising a code segment that utilizes a genetic algorithm for estimating the performance of the hardware and software for each of the different partitions.

13. A system for automatically partitioning a behavioral description of an electronic system between hardware and software for optimizing the system, comprising:

(a) logic that receives a behavioral description of the electronic system;

(b) logic that determines an optimal functionality between hardware and software of the electronic system; and

(c) logic that partitions implementation of the functionality between the hardware and software based on the determined optimal functionality.

14. A system as recited in claim 13, wherein the logic that partitions implementation of the functionality includes logic that varies at least one parameter of at least one of the hardware and software.

15. A system as recited in claim 13, wherein the hardware and software are formed on a reconfigurable logic device.

16. A system as recited in claim 13, further comprising logic that outputs at least one of a description of required processors, a description of machine code to operate the processors, and an identification of necessary hardware.

17. A system as recited in claim 13, wherein the code segment that determines an optimal functionality includes logic that generates a plurality of different partitions of the functionality, logic that estimates a performance of the

hardware and software for each of the different partitions, and logic that selects one of the different partitions based on the estimate.

18. A system as recited in claim 13, further comprising logic that utilizes a genetic algorithm for estimating the performance of the hardware and software for each of the different partitions.